

Dangerous Ideas in Zoology: Plenary Session I

Following the first session of the forum we held a question and answer session facilitated by Paul Willis. The presentations covered by this plenary session were:

- Another brick in the wall puts our future at risk: rationale for valuing the outrageous (Mike Archer, University of NSW).
- Mosquitoes are ecologically worthless (Cameron Webb, University of Sydney)
- Do good stories of koala survival threaten the political power of this species? (Rob Close, University of Western Sydney)
- Ecological assessment and the Australian resource sector: fiddling while the carbon burns (Martin Predavec, RZS NSW)
- Splitting atoms to preserve biodiversity (Corey Bradshaw and Barry Brook, University of Adelaide).

The following is a transcript of the plenary session edited for readability.

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PAUL WILLIS (MC for the plenary sessions): For those who haven't seen me operate a plenary before at these forums, I like to do it as a kind of a bit of a Star Chamber on the previous speakers. Let's ask them the difficult questions, but as a group discussion. So if you do have questions that you want to throw into the mix, please raise your hands, and we'll get the microphones over to you. Let's start from the very beginning. Mike, it is interesting that you are talking about encouraging students to have dangerous ideas when I was one of your students. It's all well and good saying that you should push the students out there to do these dangerous extravagant ideas, how do you support them practically? They're the difficult ones to find the funding for and all the other support mechanisms. So how do you provide that side of the equation?

MIKE ARCHER (University of New South Wales): I think it's fairly easy in the case of honours projects. For example, on the native animals as pets thing, I've had three students now working on aspects of that. In the *Burramys* project, we've had two people involved in that. You don't need a whole lot of resources to start exploring those issues at that point, but when you start to have to research them, two issues come up: you're right, funding; and the second thing is a lot of them start to wonder, "Who in the world is going to give me a job in this area?" because it's threatening to all the traditional established ways of doing things. Is the pet industry suddenly going to hire somebody to look after native animals?

So there are some challenges here, but I think if you don't start these balls rolling, we'll never get there. In the case of the pet thing, I've had discussions with University of Sydney's veterinarian school and I just said that they should be training people in the care and handling of native animals, start anticipating that issue, and start training vets to do this as well, and then start to create

this opportunity, and it will begin to snowball. So you've got to start. I think that's the issue. I don't think we should give up because of those sorts of challenges.

PAUL WILLIS: And the cases that you've provided, they're your dangerous ideas, not dangerous ideas from the students. Now, to just follow down that path, the world is full of the maverick problem; that is, there are a couple of mavericks through the history of science that have actually led to paradigm shifts, and science has gone forward because of their outside of the box ideas. But there are thousands of time-wasting mavericks who have done absolutely nothing, so how do you pick the right dangerous idea to back?

MIKE ARCHER: I think what I'm arguing is that we need to create the environment in which the students who come along with bright ideas don't feel afraid to put them forward. I think this kind of forum is one of those opportunities to do that sort of a thing, where they get a sense that the community is going to welcome creative ideas. At the moment, we don't do it. Australia, in general, is really good at kneecapping, where you squash ideas, we don't support creative ideas, it's very unfortunate. We're not major leaders in this area; we look to the rest of the world to take this kind of leadership, and we have as much capability as anybody else to do that. Our students are brighter, they're lateral thinkers, we need to encourage that.

TERRY DAWSON (University of New South Wales): Everything we know today is bullshit.

PAUL WILLIS: I worked at the ABC, I know that.

TERRY DAWSON: Yes, but I've been around long enough and shifted enough paradigms to know that everything we know today is bullshit. So have a good look at what you know and find out where it's wrong,

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where it's going, because that's where we've got to go. Forget about today, see if you could extend our knowledge of what's going on because I've seen a lot of ideas go down, and a lot more will.

ANNE KERLE (Ecological consultant): I'm an environmental consultant. In picking up on what Mike Archer was talking about, as well as some elements of the other speaker, I guess it's the implementation of these dangerous ideas that I think will probably end up being a common theme throughout the day. I have a daughter studying her PhD at UNSW, and she's finding it very difficult to do even partially different things within her PhD because of the bricks in front of her, who are her supervisors.

PAUL WILLIS: Someone ahead of you just squirmed in their seats.

ANNE KERLE: They did, didn't they? That's why I thought I would say it wasn't their school. These are not particularly outrageous suggestions she's trying to make, To be able to express themselves within the current institutional situation is something that's proving very difficult. If we're going to make political changes, then we've got to change the damn politicians and the way they think. I like Martin Predavec's idea of little bits at a time. I think that's a really important approach, but I think what I would like to hear is some comment about the actual implementation of how we progress some of these ideas when you know there's real inertia sitting above you, be it political, be it academic, be it whatever.

PAUL WILLIS: I don't know about changing the way that politicians think; I would be happy if we could just get them to think in the first place. Let's move along. Let's see, we had Cameron making a really interesting and powerful case for understanding why we do need mosquitoes out there in the environment, and that's an easy case to make to an audience of zoologists. How do you make that case to the people of Cairns that can only see the fact that these guys are a pest, they're a nuisance - who cares about a couple of bats munching mosquitoes?

CAMERON WEBB (University of Sydney): I think this is the interesting question and, for a start, we have to move from just calling them mosquitoes, because all of us here probably would complain if I just talked about bats or mammals, or something like that. There are a distinctly different groups of mosquitoes, some of them do us no harm whatsoever, but there's a few key species, involved in the transmission of pathogens, that we have to target.

So, from a human health point of view, it's understanding those key mosquito species in the habits in which they are found. For instance, eliminating the dengue mosquito is probably unlikely to cause too many problems because it's found in small water holes and containers in our

back yards. I don't know if they're necessarily refugees of high biodiversity. But the salt marsh mosquitoes in our local wetlands are potentially food for our bats and perhaps wading birds. I guess the emphasis here is about preserving a whole ecosystem and, if you like, living with mosquitoes and making the local community understand that we're not out to eliminate them. We're going to try to reduce large populations, but it's about preserving the ecosystem as a whole or perhaps some of those key species, so it might be the bats.

PAUL WILLIS: So, it's an education process.

CAMERON WEBB: I think it's an educational process both from the community who are living close to these wetlands and then, as a consequence, our politicians. As I put forward in my presentation, I think that mosquitoes are one of the key negative elements of our local environment, and they can push some of the community sympathies for environmental conservation to one side. I think that is one of our key issues.

MIKE ARCHER: Cameron, I'm just curious, given the fact that we know that mosquitoes, the females at least, have taken great joy in sucking our blood and transmitting bugs inadvertently, do they do the same thing to plants when they're sucking plants? Do we know if they're swapping viruses into plants or fungi, out of curiosity?

CAMERON WEBB: The short answer is no, we don't know, and one of the reasons for that is that it's one of these other big gaps in our knowledge, and I guess it comes down to these priorities. If I'm trying to attract a student to come and do some research with me, the ecological role of mosquitoes and interactions with plants is pretty much the lowest possible list of priorities, not only in terms of generating interest from potential students but funding from organisations. But you would be surprised where that could lead. Increasingly one of the key issues in terms of mosquito control in some parts of the world is exploiting the sugar feeding behaviour of mosquitoes both from a surveillance tool of pathogens but also as a sugar-baited trap for mosquitoes for control, particularly in dengue areas. So you'll never know what findings might have for disease control, not just ecology.

PAUL WILLIS: Rob, the political clout of koalas was partially addressed as a question at the end of your talk and that is: where do we draw the line? I mean, koalas are really easy to make good news stories out of because they're cute and they're cuddly, and everybody loves them, so shouldn't we be encouraging more exposure so that you have that flow-on effect to the rest of the ecosystem and to the conservation of koalas and systems?

ROB CLOSE (University of Western Sydney): As scientists, we are required to give the truth no matter what, and although this might stop us from getting

funding - fortunately, I'm retired from that now, but yes, I think we are required to give the truth.

PAUL WILLIS: Yes, but we might be scientists thinking that we can speak the truth, but we have to operate in a society where most people do not understand that, and there are important conservation messages that need to get across, and many of them can be sold on the back of a koala, you know.

ROB CLOSE: Sure.

PAUL WILLIS: I mean, particularly when, you know - who was it, the Minister for Environment who was pissed on by a koala? That got international coverage, and it actually brought the spotlight onto Australia, onto our conservation problems and onto the fact that are politicians are worth pissing on. I can see that there is the scientific truth of wanting to pull back on putting out good news stories about koalas, but isn't there a social imperative to do exactly the opposite?

ROB CLOSE: Yes, there probably is. I mean, we wouldn't have the Dharawal National Park if it wasn't for the koala. If anybody has been out to that little area on the southern edge of Sydney, it's a beautiful spot and it will protect a lot of other species. But, yes, I can't see that we've got any way but to give bad news as well as good news.

PAUL WILLIS: Martin, you raised some really interesting questions about moving across jurisdictions, and various pieces of legislation and areas of law, and I was actually reminded of the case a few years back where there was a potential trigger through the Threatened Species Act in the United States, that if they could link decline in polar bear numbers in Alaska to climate change, then there would be a whole new sweep of actions that could be brought to bear in the United States on the political scene with respect to actually doing something about climate change.

Now, from memory, while everyone was waiting for that to happen - I think we're still waiting for that to happen - it was soon jumped on by American politicians, and they rewrote the law so that trigger didn't eventuate. But are you actually suggesting something of a parallel here, that we should be able to use environmental impact statements and assessments to have a much broader impact on a global scale?

MARTIN PREDAVEC (RZS NSW): Ultimately yes, and I think if we're going to go down this path, then we need to expand it to a global scale. That will never work, we can't get politicians to agree on costs so you're not going to get a politician to agree on a global scale. But I think the first stage is to acknowledge that our actions here in Australia are having an impact overseas, and that's the impact of the burning of coal, on people as well as wildlife species overseas. Now, whether or not we actually

have to do anything about that, I think the first thing is to figure what the impacts are going to be here in Australia. So we acknowledge that we're actually going to have the impact here in Australia first off and deal with that. If there was a flow-on to global change - that would be a wonderful thing to happen.

PAUL WILLIS: The first thing that strikes me, as soon as you start talking about responsibility for the burning of the coal under the current emissions trading schemes, and carbon accounting, that is the responsibility of whoever burns it, not the people who dig it up.

MARTIN PREDAVEC: It is.

PAUL WILLIS: So, you know, you're really talking about quite a fundamental legislative shift to be able to bring to bear that kind of accounting on an environmental impact statement, which is effectively a local issue.

MARTIN PREDAVEC: I agree. It is a major change that needs to occur. If you're not actually aiming for that larger picture to start with, you're not going to make the changes. If you start with a list of a threatened species, and the idea of a threatened species impact assessment, that's well accepted by the community. So we can make those small changes and gradually expand that to look at overseas and the impacts overseas.

PAUL WILLIS: Another thing that struck me about your presentation is that if you took on 'cradle to grave' accounting into the model of environmental impact statements, which is essentially what you're suggesting, that could provide some leverage into moving down the path that you're suggesting.

MARTIN PREDAVEC: Exactly.

PAUL WILLIS: Corey, can I express the gratitude of the whole audience that you didn't actually drop your dacks, and also thank you so much for introducing the elephant as an SI unit. I'd like to start here again with a comment rather than a question, and that is that the documentary that has just been released, Pandora's Promise, makes a very effective case for nuclear and is essentially the journey of a number of prominent environmentalists who have moved from the no nuclear camp into being advocates for nuclear as part of the energy equation for the future.

Just one of the things that blew me away in that, one of the little factoids I took away, is these mobile phones that we're all carrying around now, the smart phones, you know, we all think that's an energy efficient little beastie. You plug it in overnight, and it will run all day without a question, not using much energy. The actual energy budget for each mobile phone is equivalent to a fridge by the time you add in the servers that are

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required to provide the internet service, the fact that you're bouncing messages off of satellites. The whole network, that's the energy equivalent of a fridge, and we're adding a million of these every couple of weeks to the world budget. Have you seen the doco, Pandora's Promise, and does it elaborate and make the same case you're advocating?

COREY BRADSHAW (University of Adelaide): I was a fence-sitter on this, I have to say, largely agnostic about nuclear power because I didn't know much about it, going back three or four years ago. Co-sharing a lab with Barry Brook certainly brought me into the light about all of these things and, you know, I'm a scientist like most people in the room, so I started looking at the numbers. When you look at the numbers and you see that our energy is skyrocketing, population size increasing, biodiversity declining, land use increasing agricultural requirements, you come to the conclusion very quickly that you have to put nuclear on the table.

It's not saying that it will replace everything else, not saying that renewables don't have a role. Everything does have a role, but we have to put it on the table and some more people that I talk to that have looked at this rationally, just like the people in the film who start looking at the numbers, they largely come to the same conclusion. I don't know many colleagues of mine who don't, once you start presenting the case, go, "Well, you know, that's a sound argument." Not necessarily all of them change their minds on that, because there's a huge emotional baggage that stems from the 1950s horror films, and it's hard to change that.

But it is changing, and more and more people like us start to raise that flag and say we don't really have a choice any more. I always argue that, when it comes down to the safety issues, if you look at the numbers, including cancers, latent deaths from things like Fukushima and Chernobyl, coal still has well over 150 times the death rate that nuclear ever has, and that's comparing functioning normal coal fire power plants to the worst disasters in nuclear history. So it's hardly a fair comparison. Again, even on the safety side, we still have no choice. I always argue too that, yes, if we go nuclear intensive, some people might die, but orders of magnitude more will die if we don't, and biodiversity will disappear. So, again, to me it's a no-brainer.

LAURA WORTHINGTON (RPS): I'm just wondering how you can suggest that we can get the public on board with nuclear energy, given that a lot of people outside of this room are getting all of their information from whatever is on A Current Affair, Today Tonight, and science communication is quite inherently difficult anyway, given it's quite technical?

PAUL WILLIS: How do you convince the masses, Corey?

COREY BRADSHAW: I think in this particular case it's going to be a whole lot easier than convincing them of some insect or worm that's underneath a tree is valuable. I was recently in Finland, at a Making Your Science Matter course, and we were talking to a Finnish politician, and he said, "When you biologists come up to us and have a policy brief, if you don't turn it into money, we don't listen. So everything you say has to be on the financial level. When you start showing the numbers and just the costs associated with nuclear, suddenly people go, 'Oh, yeah', because money rules, and when we can show them that you can actually do it in the timelines with the budgets they have, and then provide, you know, orders of magnitude more energy than they could ever hope for with renewables or coal, people start to go, 'Hmm.'"

So I think that's our best bet; I think it's really down to the money. If you can get all the other people on board who have the fears and, if you're talking about conservationists, just show them the land consumption or the land use required for renewals, and people start to go, "Maybe that's not the best idea." To dominate the energy portfolio, that's when it still has a role. Some people say if you're pro nuclear, you're anti-renewable. That's bollocks; you can have both.

PAUL WILLIS: Thank you very much also for introducing the word 'bollocks' in today's proceedings.

MIKE ARCHER: I think one of the things I would say is I think that most people raised here using nuclear energy is: what do you do with waste? You addressed that: some of it could be recycled. Yes, you can, but there's still the issue and the proposal that we bury tonnes and millions of canisters in central Australia somewhere, and eventually we'll see it in the water table. I don't understand why don't we consider dropping those containers very strategically on a cable to deep sea trenches, the planet's natural disposal system, and expecting never to see that stuff again, it will come back about 20 billion years later? We have a way of getting rid of that waste that doesn't involve, necessarily, putting it on any continental area at all. I mean, it should be really easy, and he said he didn't know why anybody wasn't thinking about this as well.

PAUL WILLIS: I think, technically speaking, it would be an andesite, not a granite, but anyway, yep.

COREY BRADSHAW: I've heard that one before and if you look at the physics of it, it does make a lot of sense. But again I think it's going to be a harder sell than even burying it in the desert in the middle of Australia, simply because you put something in your water, people think that because of the distribution system, it's going to end up, as you say, in the fish that they eat. If you look at the physics of it, it wouldn't, but again I think that's going to be a harder sell. But I always come back to the point

about, when you talk about waste, that's just badly-used uranium, and we can use it again. You wouldn't have to mine a single gram of uranium for the next 300 years if we had phase 4 integral fast reactors online right now. It would require building 5,000 reactors over the next 50 years, but we can do it.

RACHEL BLAKEY (University of New South Wales):

I have a few questions. One of them was: when you're crunching numbers, do you take into account the life cycle of a nuclear power station, so the mining and then all of the decommissioning afterwards and all these sorts of things that require a lot of dirty fields? And the other thing was: are you taking into account, when you're talking about the role of renewal energy the quick advances that are being made all over the world into the future how much cheaper and more useful this is?

COREY BRADSHAW: The first one, yes, all the costs are put into what's called levelised cost of electricity, and

those include the full life cycle, including decommissioning, right from the mining of the mineral, if that's the case, and to the replacement costs, right through to the decommissioning and everything associated. It's a full costing. Those results are publicly available, if you want to read them, in the world energy reports.

The second one is, yes, to a certain extent we do use some of the future projections, but we don't go too crazy with those because a lot of those technologies haven't been demonstrated. Most of our numbers are crunched on what we can do now. If you get too prognostic or crystal ball anything with some of these technologies, you can really bias it towards what you want as opposed to what's available and what you can do. In a lot of ways, all of these technologies are improving, including coal, but they're all tracking pretty much at the same rate. And if you look at the reliance and the emissions profiling over the next few years, we're not getting any better, irrespective of these technological advances.

PHOTOGRAPHS



Peter Banks (President of RZS NSW 2007-2014) welcoming everyone to the forum.
Photo by Dan Lunney.



Rob Close.
Photo by Dan Lunney.

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Paul Willis facilitating the first plenary session.
Photo by Dan Lunney.



Martin Predavec.
Photo by Dan Lunney.



Corey Bradshaw.
Photo by Dan Lunney.



Cameron Webb.
Photo by Dan Lunney.

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Mike Archer FRZS
responding to a question.
Photo by Dan Lunney.



The audience for the first
plenary session at the
Australian Museum.
Photo by Dan Lunney.



Mike Archer FRZS handing the microphone to Terry Dawson FRZS. Anne Kerle sits two rows behind in yellow.
Photo by Dan Lunney.

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Paul Willis.
Photo by Dan Lunney.